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Regulatory Impact Analysis Course

Under the
Support for Lebanon's Accession to the World Trade Organization Project

Funded by
United **S**tates **A**gency for **I**nternational **D**evelopment (**USAID**)

19-22 September 2011

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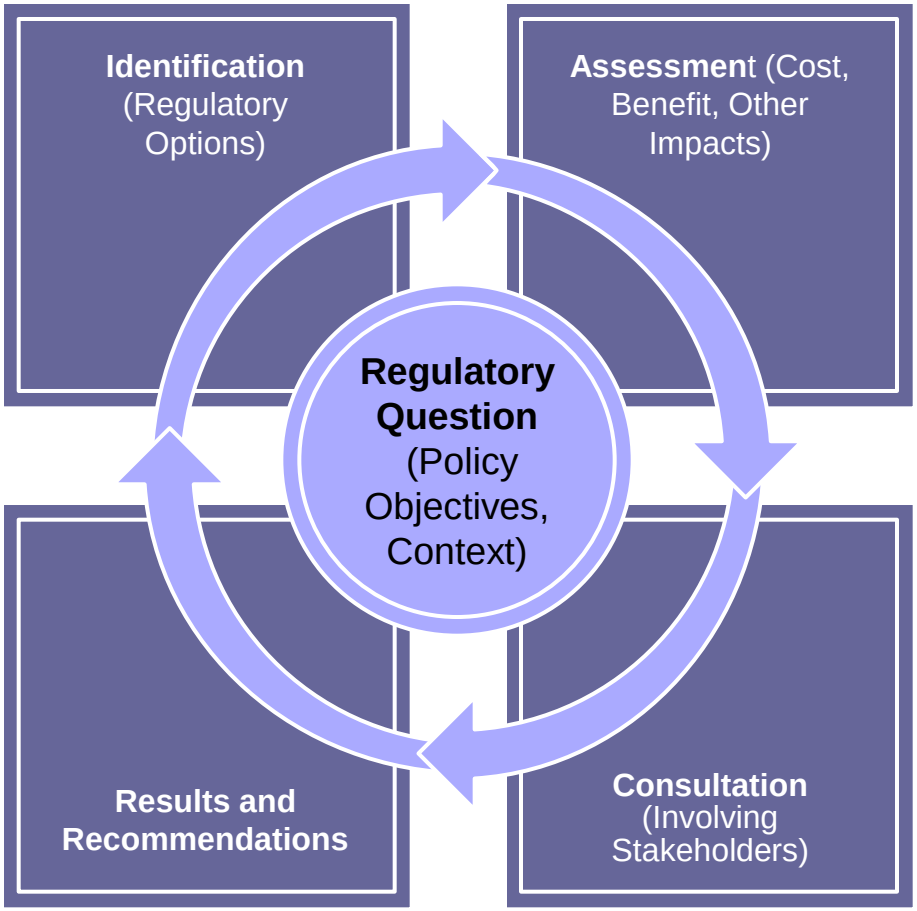

Identification (Regulatory Options)
Assessment (Cost, Benefit, Other Impacts)
Regulatory Question (Policy Objectives, Context)
Results and Recommendations
Consultation (Involving Stakeholders)

RIA Course Contents

Day 1

- Introductions
- A General Introduction to Why We Perform RIAs *(Dr. Chris Crafton)*
- Deep Dive into Cost Benefit Analysis *(Dr. Chris Crafton)*

Day 2

- Continuation of Cost Benefit Analysis *(Dr. Chris Crafton)*
- Introduction to Input-Output Models and Analysis *(Jennifer Li)*
- Input-Output Analysis and Multipliers *(Jennifer Li)*

RIA Course Contents

Day 3

- Dynamic Macroeconomic Models for Regulatory Impact Analysis *(Mark Gerner and Jennifer Li)*
- Hands-On Practice with a Dynamic Macroeconomic Model and Scenarios *(Mark Gerner and Jennifer Li)*

Day 4

- Recap of the RIA Course *(Dr. Chris Crafton)*
- Communicating Public Policy in Meaningful Ways That Engage *(Karen Boothe)*
- RIA: Mandate and Road Map *(Rami Takrouri)*
- The New Policy Development Process *(Rami Takrouri)*

Introduction

- **Dr. Chris Crafton:** more than 25 years of experience as an economist responsible for both regulatory and legislative affairs for several Fortune 500 firms and government
  - **Booz Allen Hamilton:** Managing a team of economists who conduct regulatory assessments and economic impact modeling (macro and microeconomics) for both private sector and global government clients
  - **Created Booz Allen's Center for Macroeconomic Modeling in 2009**
  - Leads a team of economists deploying a portfolio of macroeconomic models to assess global economic impacts
  - **Motorola:** Vice President for legislative and regulatory affairs for broadband
  - **Verizon:** Director for legislative and regulatory affairs for telecommunications
  - **Virginia State Corporation Commission:** Director of economic research and development for more than 20 regulatory agencies
  - **Oak Ridge National Laboratory (NRC):** Economist for the commissioning of nuclear powered generating units

Introduction, continued

- **Ms. Jennifer Li** is a firm subject matter expert for using macroeconomic models to determine impact of policies on the economy as well as applied economics, regulatory impact analyses, cost benefit analysis, and budgeting and financial analysis
  - Received a Bachelor of Science Degree in Economics from Texas A&M, and an M.A. in economics from George Mason University
- **Mr. Mark Gerner** is also a firm subject matter expert in using macroeconomic models to determine impacts of policies, regulations and investments on the macro economy such as impacts to GDP, jobs, consumer spending, productivity, etc.
  - Received a Bachelor of Science degree in economics and finance from Bentley University, and a Master's Degree in Economic and Regulatory Policy at Georgetown University

Participant Introduction

Module 1

- The Importance of Regulatory Impact Analyses
- Background on the Economics of Regulation
- How to Perform an RIA
  - Using a Worksheet Template
  - Case Studies
- Input-Output Analysis
- Dynamic Macroeconomic Modeling

What you will learn

- Why we perform RIAs
- How to do a simple RIA
- How to use a simple template
- What is input-output and why we use it in RIAs
- Why we use software-based macroeconomic models in RIAs

The Importance of Regulatory Impact Analysis in Rulemaking

Why we care about regulation

- The **purpose** of regulation: markets when they perform well are "self-regulating;" actions of competitors, prices, et. al., "regulate" firms
  - Government intervenes because of policy objectives it believes cannot be accomplished otherwise: increasing competition and openness of markets, promoting investment, improving working conditions and employment, addressing public health, the environment, et. al.

- Why the ***intended purpose*** may not be realized: the intended purpose of the regulation by the regulator may not be realized due to the ability of market participants to:
  - Avoid or shift costs of the regulation
  - Exhibit rent-seeking behavior

- This is important because regulations impose additional, non-market constraints on a firm's choices and behavior; if not evaluated and structured properly, regulations can result in unintended outcomes
  - Any regulation is likely to affect different firms differently, which is why careful assessment is necessary

***Take away*: regulation can result in "unintended consequences," which is why a careful assessment of a regulation is needed**

Definition of RIAs

- RIA is a policy tool for providing detailed information about the potential effects of regulatory measures – **of both the intended and actual effects** - in terms of costs and benefits to all parties affected by the regulation
  - RIA facilitates careful consideration of the details that should be taken into account when designing and implementing a regulation
- RIAs help ensure that government regulations are effective and efficient and result in the greatest net public benefit
  - They can be performed ex ante and ex post
- RIAs help ensure that stakeholders are fully aware of the benefits and costs that are likely to result from the proposed regulation
  - This information can be helpful in advocating either for or against a regulation
- There are multiple ways of performing an RIA; the analyst should select the option that best fits the situation, e.g., use of an evidence-based tool that meets the requirements for accuracy
- Because of the perceived need to quantify all costs and benefits, RIAs are oftentimes viewed as difficult to do

Why we care about assessing regulations - performing RIAs

- The reason why we perform RIAs to carefully and fully evaluate the costs and the benefits, ***both intended and actual***, of a regulation:
  - The cost causers may not be the cost bearers
  - The most active stakeholders may be the most "impacted" by the regulation but they may also be the ones most benefited
- We try to assess the impacts of a regulation over time because:
  - The stream of realized benefits may differ significantly from the stream of expected (actual) costs in both timing and magnitude
  - Data should not be collected in a vacuum: data collected is "ex post" and important causal factors can be missed or misinterpreted
- Governments are interested in performing RIAs because it improves their understanding of real-world impacts, helps integrate multiple policy objectives, improves transparency and consultation, increases government accountability
- The public attains greater awareness and more effective participation through a better understanding of "who gains" and "who loses"

Elements of an RIA

- The typical RIA is based upon a **cost-benefit-analysis framework**, but there are other ways to perform RIAs effectively

- We first define or specify the proposed action, i.e., the regulation:
  - what is the policy objective of the regulation?
  - what is being proposed as (clear statement of) the regulation?
  - what are the options, if any, to the proposed regulation that will also achieve the desired policy objective?

- Identification and evaluation of the extent and magnitude of the impacts by looking at the benefits, costs and distributional effects on which stakeholders

- Identification of stakeholders enables stakeholder participation throughout the assessment process

- RIAs also enable the development of enforcement and compliance strategies, as well as monitoring mechanisms to evaluate a regulation

Challenges in performing an RIA

- The concept is dependent upon a comparison of the expected benefits with the expected costs – can be quantitative, qualitative or both

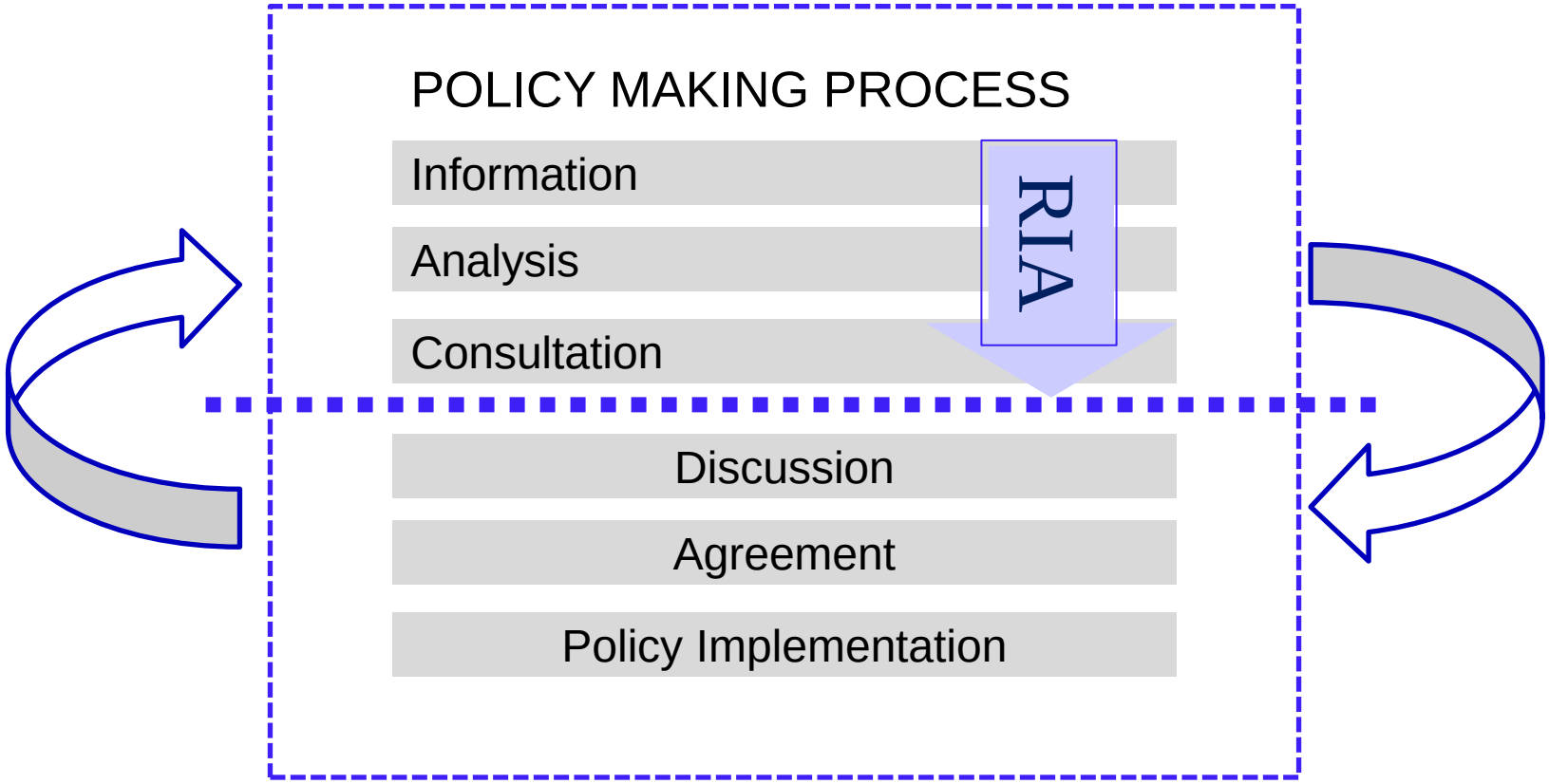
- It can be difficult to perform
  - Discounting: there is oftentimes disagreement over the discount rate
  - Direct monetization/quantification: criticized for being difficult for the benefits side in particular
  - Measuring qualitatively: criticized for being vague, subjective
  - Cost-effectiveness analysis: assumes away any differences in the benefits

- These challenges can appear insurmountable
  - Reluctance of government to adopt an RIA process is often due to limited knowledge, inertia, reluctance to "lose control" over the regulatory process, and ideological motives
  - Lack of reliable data
  - Lack of a coherent, evidence-based participatory process for stakeholder engagement

- While there are many challenges in performing an RIA, obtaining some added information on the relative costs and benefits is always a good idea, notwithstanding the process
  - We have created an effective, simplified method for performing an RIA

Take away: while RIAs can be a challenge, we have developed a simplified process for performing an RIA using a worksheet template

PRIA in the Policy Making Process



Source: OECD

Understanding Regulation: Some Background on the Economics of Regulation

The economics of regulation

- Government intervenes in a market when the unregulated market fails to produce the optimal level of a particular good or service
  - This is known as “market failure”
  - Governments seek to remedy market failure to avoid a misallocation of resources

- Market failure is said to occur when one of the following conditions exist:
  - Externalities: when an economic activity of one party imposes costs (or benefits) on another party, e.g., a firm polluting a river or a national park
  - Public goods: a good where consumption by one individual does not prevent consumption by another individual, e.g., national defense
  - Monopoly power: where the market power of one firm leads to a misallocation of resources, e.g., a firm that controls a scarce, natural resource and restricts production to keep prices high
  - Informational problem: market participants do not have the relevant information to make correct decisions, e.g., product safety regulation

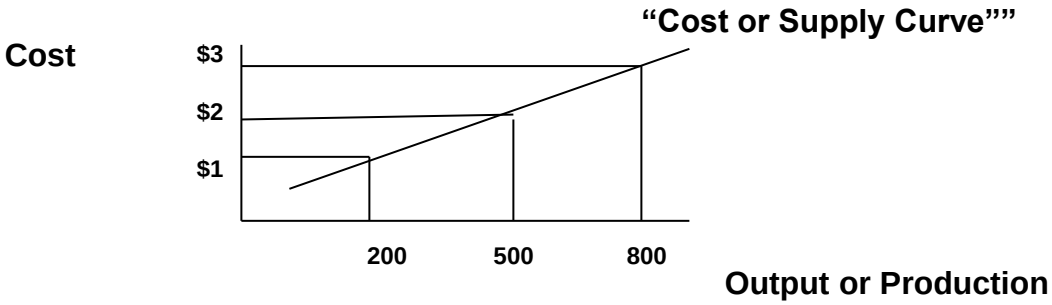
Regulation in practice

- Regulations oftentimes do not correspond to industries characterized by market failure
  - regulators that lose sight of their public mission, e.g., special interests “influence” regulators
  - Regulators that adopt the perspective of the regulated industry, e.g., the industry “controls or captures” the regulator
- Industries or firms may favor a particular regulation if they believe they can withstand the added costs of the regulation better than their competitors
  - This provides them with a competitive advantage if their competitors are forced to exit the market due to the added costs of regulation
- It is important to remember that regulation imposes a cost on an individual, group of individuals, a firm or an industry
  - ***Questions: do the actual benefits resulting from the regulation exceed the actual costs of the regulation? Who actually benefits and who actually bears the cost?***

Simple example: a producer's total costs as it increases the production of hamburgers

Price of a Hamburger	Cost of a Hamburger	Output	Total Cost
$3	$1	200	$200
$4	$2	500	$1000
$5	$3	800	$2400

- We see in the table above that as the firm produces more hamburgers (output), total costs increase
- We can draw a curve showing the cost and production of hamburgers:



Continued

- The government decides to pass a regulation on the grade or quality of the beef that the producer uses to make hamburgers: the producer must now purchase a higher grade of beef, adding to costs

- The producer must also hire an inspector to ensure compliance with the new regulation, or pay a fine, and a lawyer to file the paperwork with the government, adding to the total costs of production

- The full costs of the regulation increases the producer's total cost of production by 25¢

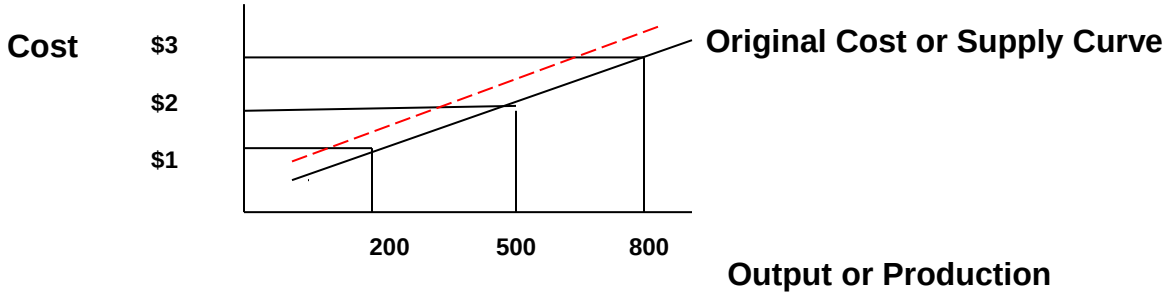
Cost of a Hamburger + Added Cost of Regulation	Output	Former Total Cost	New Total Cost with the Regulation
$1 + $0.25	200	$200	$250
$2 + $0.25	500	$1000	$2250
$3 + $0.25	800	$2400	$2600

How to Perform an RIA – the Components: Specifications of the Regulation, the Stakeholders, Benefits, and Costs

Continued

- We can draw a new cost or supply curve with the new regulation
- The new cost or supply curve is shown by the **RED dashed line** :

NEW Cost or Supply Curve shifts up vertically by 25¢



To produce hamburgers after the regulation takes effect, the firm must now charge more to cover its higher costs with the new regulation and earn a normal profit than prior to the passage of the regulation

The benefit to society is a tastier hamburger and possibly a safer one but who bears the costs?

Questions: do the actual benefits resulting from the regulation exceed the actual costs of the regulation? And who bears the costs of the regulation?

Firms with market power will be able to shift certain costs onto consumers in this example It frequently is not obvious as to who benefits and who bears the costs until an RIA is performed

An RIA measures changes to a "baseline"

- We think through, looking at the current state:
  - Which products, characteristics and prices will be impacted by the new regulation?
  - Will there be ease of substitution and switching by producers and consumers?
  - Suppliers, locations and access -- how will they be affected?
  - Market dynamics, competition profile, price, diversity and product differentiation, etc.

In performing an RIA, we are measuring the "delta"

- We consider the current state or baseline conditions and then hypothesize the new state if the regulation is enacted
  - The difference between the current state and the new state with the enacted regulation is a measure of the impacts
- Economists using large macroeconomic models also compare the expected changes resulting from a regulation to a baseline

How to perform an RIA: the elements of an RIA

- The specification of the proposed regulation:
  - what is the policy objective?
  - what is being proposed as (clear statement of) the regulation?
  - What are the options, if any, to the proposed regulation that will achieve the desired policy objective?
- Identification of the stakeholders being as comprehensive as possible (include supply chains)
- Identification and evaluation of the impacts: benefits, costs and distributional effects
  - It is very important to identify and measure the **direct, indirect and induced** effects (for both the benefits and the costs)
- It is also helpful to develop enforcement and compliance strategies, as well as monitoring mechanisms, to evaluate the regulation ex post

Take away: we will be spending our time on the first three elements and bringing all of these elements together via a template worksheet

Specification of the proposed regulation

- A clear statement of the policy or regulatory objective
  - What is the problem that the government is seeking to fix
  - Is the problem likely to change over time?
  - Is the problem sufficiently large to justify government action?
  - Can the proposed regulation address the problem effectively?
  - Can the government enforce the regulation?
  - Thinking through what alternatives exist

Identification of the stakeholders

- What groups – e.g., businesses, public at large, government entities – will be affected by the regulation?
- What is the size of each group?
- How will each group be impacted?
  - How large are the expected impacts and when in time will they occur?
  - How long will the expected impacts last?

Identification and evaluation of the impacts: direct, indirect and induced effects

- In thinking through the benefits and the costs, it is essential to be as comprehensive as possible: think through the **direct, indirect and induced costs and benefits** likely to result from the proposed regulation

- **Direct effects (impacts)** are: costs or benefits that are a direct result of the regulation such as the number of jobs created in new manufacturing when a regulation requires new safety equipment on automobiles (a benefit)

- **Indirect effects (impacts)** are: costs or benefits that are ancillary to the direct costs or benefits such as the number of jobs created in support of the manufacturing of the safety equipment, such as new jobs to supply the new office equipment (a benefit)

- **Induced effects (impacts)** are: costs or benefits that result from the actions of affected economic agents such as the number of jobs created as a result of the spending of wages on groceries or housing of the new employees working on manufacturing the new equipment

- **Distributional effects**: a basic aspect of RIA is that it should be conducted with the "whole of society" in mind, not just those stakeholders who are *intended* to be impacted; assessing direct, indirect and induced impacts takes care of assessing the distributional effects

Benefits

- The expected benefits are generally more easy to identify than the expected costs because they are typically the reasons for the adoption of the regulation

- Determining the size of the benefits and monetizing them is oftentimes a significant challenge
  - Due in part to the difficulty in measuring or monetizing the benefits such as number of lives saved, reduced pollution, etc.
  - Can discourage policy makers, regulators and stakeholders from performing RIAs

- The benefits expected to result from the regulation should be “decomposed” into direct, indirect and induced benefits:
  - Direct benefits: e.g., the number of new jobs created
  - Indirect benefits: e.g., the new businesses or new growth of existing businesses (both output and employment) resulting from the support of the direct benefits
  - Induced benefits: e.g., increased economic activity resulting from expenditure of added wages

Costs

- The costs of complying with a regulation should be “decomposed” as well
  - Direct costs: costs that directly result from complying with the regulation, such as the cost of:
    - buying any new equipment needed to meet the regulation
    - wages paid in employing additional needed staff
    - costs related to any needed changes in production processes
    - collecting, storing or processing needed information for the regulator
    - costs to the government of administering and enforcing the regulation
  - Indirect costs: costs that are generated as a result of the direct costs, such as the cost of:
    - added overhead costs
    - added office space
    - additional employee benefits
  - Induced costs: costs that were not intended by the regulator (“spillover costs”); may be costs to “third parties” that are generated as a result of either direct or indirect costs
    - added traffic congestion and pollution due to a larger number of employees commuting

The Classical RIA

- The classical RIA is based upon a rigorous cost-benefit analysis framework comprised of the following:
  - Estimates of the benefits and costs incremental to a realistic baseline
  - Treats risk and uncertainty transparently and objectively
  - Quantifies and values all benefits
  - Quantifies and values all costs
  - Discounts all values (costs, benefits) to the present
- Quantification can present an insurmountable challenge and oftentimes discourages policy-makers, regulators and stakeholders from performing an RIA
- This is most unfortunate in particular because much information on the relative costs and benefits can be gleaned through a thorough yet simple comparison process

Take-away: we have simplified the requirements in performing an RIA through the use of a worksheet template: the Process-Model-Worksheet©

Bringing it All Together: Using a Worksheet Template

An effective RIA is a process

- that involves:
  - asking the right questions in a systematic and structured way to support a wider and more transparent policy debate
  - identifying and evaluating to the extent possible all of the potential impacts arising from government action or non-action
  - communicating the information to decision-makers and stakeholders

We accomplish this by using an enabling worksheet

Using a worksheet template

- Performing an RIA does not have to be difficult
  - A step-by-step process is a good start in performing the assessment
- The worksheet template walks you through the “thought processes” behind the RIA
  - Has a logical flow
  - Asks the key questions
  - Enables information collection
  - Brings it all together for a net assessment
  - Does not rely on quantitative analysis so is not highly data dependent
  - Permits the addition of quantitative analysis where good data is available
- What does the worksheet look like and how does it “work?”
  - Uses a flowchart concept
  - Automatically uncovers the distributional effects by thoroughly considering full benefits and costs

Refer to the blank worksheet template handout

Refer to the blank worksheet: the Benefits Assessment

- Step 1: requires a clear statement of the regulation, the purpose, and the stakeholders
- Step 2: identifies the intended beneficiaries and the intended benefits, such as:
  - Industry, firms: increased efficiency/productivity; reduction in workplace accidents and injuries; increased human capital; improved market information; greater economies of scale
  - Consumer, Civil Society: lower prices; improved safety; higher quality; better information
  - Government: improved public health (health & safety regulations); improved information
- Step 3: identifies the expected (actual) beneficiaries and the actual benefits as well as the value of those benefits
  - and also asks if the regulation provides certain stakeholders a competitive advantage
- Step 4: plots the stream of intended vs. expected benefits over time

Refer to the blank worksheet: the Cost Assessment

- Step 5: asks who are the intended cost bearers, what are the intended costs, and when are the costs expected to be paid, such as:
  - Industry/firms: Compliance costs ; cost of lost sales; cost of license fees or other charges
  - Consumer, Civil Society: Higher prices; reduced range of products; delays in the introduction of new products
  - Ggovernment: Administrative costs; verifying compliance; enforcement costs
  - Other: Costs of reduced competition (efficiency losses and transfers from consumers to producers); distributional costs: poor vs. wealthy; restrictions on innovation (developing and marketing new products)
- Step 6: who are the expected (actual) cost bearers, what are the expected costs, and what is the value of those costs
  - and also asks about the ability of each cost bearer to avoid or shift the cost of regulation
- Step 7: plots the stream of intended vs. expected costs over time
- Step 8: brings the actual stakeholder benefits and actual stakeholder costs together for comparison

Sample Case Study Using the Worksheet Template

- Refer to Case Study 1 in Appendix 1
- Use Completed Copy of Worksheet Template (PMW)

Practice Case Study Using the Worksheet Template

- Refer to Case Study 2 in Appendix 1
- Use Blank Copy of Worksheet Template (PMW)

The Purpose of Input-Output Analysis in RIAs

Challenges with Regulatory Impact Analysis: using input-output tables

- An effective RIA involves:
  - asking the right questions in a systematic and structured way to support a wider and more transparent policy debate
  - **identifying and evaluating to the extent possible all of the potential impacts arising from government action or non-action**
  - communicating the information to decision-makers and stakeholders
- If we omit an important cost component or benefit component, our RIA will be incomplete and our results will be inaccurate
- Input-Output (or I-O) enables us to more completely identify all of the cost and benefit components to better ensure accuracy of our analysis
- We use an “I-O Table” to help us understand an industry’s supply chain, for example, by thinking through a firm’s or industry’s suppliers and consumers

Input-output overview

- Input-output tables provide an accounting framework structure that is representative of a regional economy **describing flows to and from industries, institutions, and households**
  - Industries purchase from other industries
  - Industries sell to other industries
  - Industries sell outside the local economy
  - Industries buy from outside the local economy
- Transparency of the framework **helps us track the flow of money** between entities
- Input-output analysis can be used to measure impacts to overall economic activity resulting from changes in policy or regulations
- It helps ensure that ***ALL*** of the costs, benefits and stakeholders have been identified for the RIA!

The Purpose of Macroeconomic Modeling in RIAs

Challenges with Regulatory Impact Analysis: using computer-based models

- An effective RIA involves:
  - asking the right questions in a systematic and structured way to support a wider and more transparent policy debate
  - **identifying and evaluating to the extent possible all of <u>the potential impacts</u> arising from government action or non-action**
  - communicating the information to decision-makers and stakeholders

- The "potential impacts" happen over time
  - If we are assessing a regulation or a policy at a time when there are many, significant changes occurring in an economy, our estimates will likely be less accurate

- Using software based models, we can better capture future impacts
  - The models can handle hundreds of variables representing the complexities within economies
  - The models are dynamic: they can account for volatility in the current or future state

A portfolio of methodologies for performing RIAs

Examples	*Scenario Types*	*Impacts Computed (typical)*	*Benefits/Limitations*
Simple Cost Benefit Analysis (CBA)	Project costs Project benefits	Captures the direct cost and monetized benefits provided by a particular alternative; may include accounting for project risks that decrease benefits or increase cost	▸ Compares quantified benefits to costs over time for use in ROI calculations ▸ **Omits indirect and induced costs and benefits, thereby leading to an "under-estimate"**
Input-Output Analysis	One time economy-wide changes to GDP and employment resulting from a single change in industry output, employment or spending changes	Changes in total revenues, total employment, household income, tax revenues, et. al., as a result of sectoral (single or multiple) change(s); computed as one single "shock"	▸ Captures how changes in an industry's revenue, output or employment affects all upstream and downstream suppliers' revenues and employees' incomes as a single change or "shock" ▸ Dependent upon available National Income Accounting data from country's statistical agency ▸ **Static analysis; does not provide forecasts, thereby very limited**
Econometric/ Computable General Equilibrium (CGE) Model	General economy-wide or region-wide impacts; changes to prices, spending, costs, employment, taxes, capacity, et. al.	Changes to GDP (total or by industry), employment (total or by industry), personal income, tax revenues, in/out migration, exports/imports, et. al.	▸ Prices and output quantities adjust to equalize production and demand (optimization) ▸ Requires time for model construction ▸ **Most rigorous to capture all feedback loops and multipliers associated with spending/investment within a country or region**

Gather and Define

Upfront Economic Analysis

1. Which infrastructure investments will deliver the largest number of net benefits in 2014?
   - What investments in infrastructure should be made in the next 3 years to achieve "X%" increase in growth?
   - How can we allocate Aid funding and attract investment for the quickest economic recovery?

Client Stakeholder Input

Economic Impact Assessment Modeling

2 Micro Analysis

Deconstruct each scenario into its microeconomic component elements, identifying:

- ✓ *Assumptions*
- ✓ *Primary, secondary, and tertiary variables affected:*
  - ✓ *Population*
  - ✓ *Government Spending*
  - ✓ *Electricity Fuel Cost*
  - ✓ *Industry Sales*
  - ✓ *Consumer Prices*
  - ✓ *Industries*
  - ✓ *Employment*

3 Modeling Portfolio

Employ proven and reputable forecast models such as from *Oxford Economics, REMI, Inforum, Fathom, et. al.*

Additional Tools for Validation:
- Static Input / Output Modeling (IMPLAN)
- Global Impact Modeling (GTAP)
- Global Insight
- RIMS II Multipliers

Use multiple methods and models for verifying results

Results

Output

Project

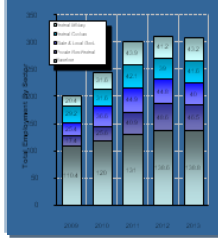
Output variables projected out 10+ years, including:
- Gross Regional or Domestic Product (by final demand categories and by sector)
- Employment (by demand and sector)
- Investment
- Disposable Personal Income
- Relative Factor Productivity
- Relative Fuel Cost
- Economic Migration
- Interest Rates
- Stocks
- Bonds
- 190 Countries

4 Validate baseline forecasts with key stakeholders

5 *The Cost Benefit Analysis includes direct, indirect, induced effects, and accounts for project RISK*

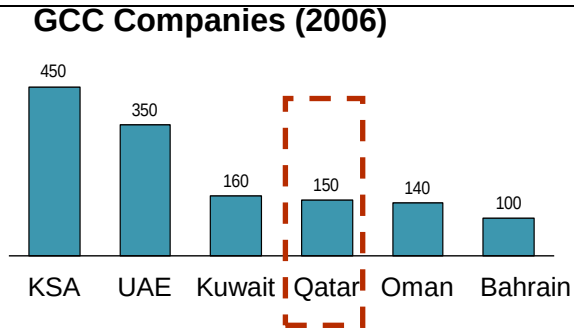
6 *Interpret and translate results for each project*

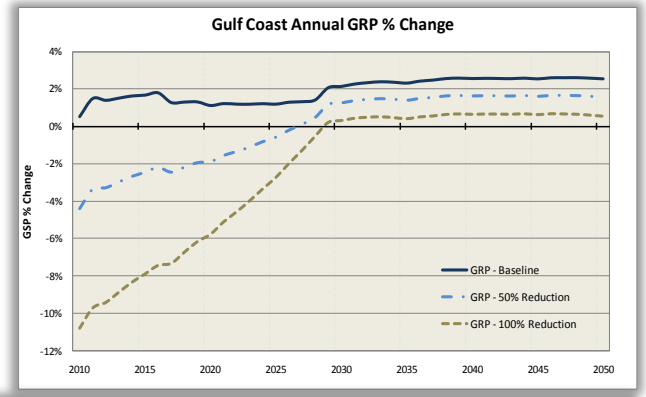
Impact Assessment

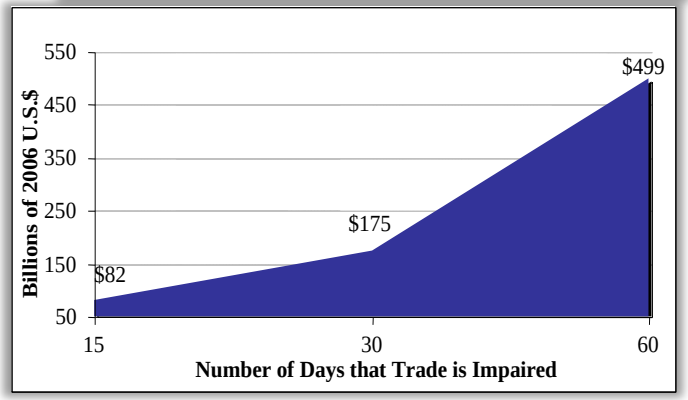


Examples of analyses:

- **U.S. Presidential Commission on the BP Deepwater Horizon Oil Spill:** a regulatory impact assessment of the oil and gas sector in the Gulf Coast Region and Alaska
- **Government of Singapore, Ministry of Transport (MOT)**: a 3 year project for Singapore's MOT and for the Asia Pacific Economic Cooperation (APEC), evaluating the regulatory and economic impact of port closures on 12 APEC member economies; developed a trade recovery program that was adopted by the WCO as part of its Framework of Standards
- **Qatar Petroleum**: developed an economic model of Qatar's energy sector to estimate the economic impacts on the Qatari economy of privatization of the sector; performed an analysis of alternative policy options for liberalizing the oil/gas sector of Qatar, with several industry, sector and global models
- **US NORTHCOM**: completed a US port analysis to determine the impact of individual and combined port shut-downs on the local community, regional and national economies







What you learned….

- Why we perform RIAs
- How to do a simple RIA
- How to use a simple template
- What is input-output and why we use it in RIAs
- Why we use software-based macroeconomic models in RIAs

Module 2

- An In-Depth Look at Classical Cost Benefit Analysis
  - Accounting for time in our analysis